REMARKS

Claims 14, 16-20, 22-30 are pending in the application; claim 15 and 21 have been canceled with the instant amendment; claim 30 has been added.

Specification

The errors pointed out in the abstract as well as the paragraph of page 5 of the specification have been corrected.

Rejection under 35 U.S.C. 102

Claims 21-29 stand rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's admitted prior art (AAPA).

Claims 22 to 28 are amended to depend from claim 29 which in turn is dependent on the method claim 14.

It is respectfully submitted that AAPA sets forth that "A bonded material structure and thus sufficient dynamic loadability cannot be reached with this solution." (last sentence of third paragraph of page 1) and that "A fast connection of both rings is reached only in exceptional cases. Different materials generally have different expansion capacities so that the rings tend to separate (the shrink connection separates) rather than to remain fixed together." (lines 9 to11 of 4th paragraph of page 1). The present invention however teaches that:

"It was found that the at least two workpieces are fixedly connected to each other even when they had been placed only loosely into each other beforehand and had not been shrunk. The composite shows characteristics of a cold pressure welding connection; these characteristics are the result of pressing together the surfaces of the workpieces at very high pressure." (see page 2, second paragraph form the bottom of the page). The composites of the present invention are therefore structurally different from the disclosed composites because they exhibit a strong bond and are fixedly connected.

MPEP 2113 sets forth in the second paragraph under the heading

PRODUCT-BY-PROCESS CLAIMS ARE NOT LIMITED TO THE MANIPULATIONS OF THE RECITED STEPS, ONLY THE STRUCTURE IMPLIED BY THE STEPS:

"The structure implied by the process steps should be considered when

assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)"

The step of axial roll forming the composite workpiece employs a special arrangement for pressing the first and second hollow cylindrical workpieces against each other: this is done between two diametrically opposed outer roll forming tools and an inner rolling arbor or between two diametrically opposed outer roll forming tools and an inner roll forming tool. The special feature of the axial roll forming process as used in the present invention in contrast to other rolling processes is explained in the specification on pages 5 and 6 in connection with Figs. 7 to 10. The axial roll forming step of the present invention produces a strong, fast connection and the composites of the present invention are therefore not anticipated by AAPA.

Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by *Timmermans (US 3,859,831)*. Claim 21 is canceled.

Reconsideration and withdrawal of the rejection of the claims under 35 USC 102 are therefore respectfully requested.

Rejection under 35 U.S.C. 103

Claims 14-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *Timmermans* in view of *Ficker et al. (DE 19526900)*.

With regard to claim 14 the examiner argues that *Timmermans* discloses a method wherein two hollows cylindrical workpieces m and n of different materials are inserted into one another as set forth in col. 1, lines 29-31, and Fig. 1. Subsequently, according to the examiner the workpieces are axially roll-formed by pressing the two

hollow cylindrical workpieces against each other between an outer roll forming tool (a) and an inner roll forming tool (e). The examiner states that *Timmermans* does not disclose pressing the two hollow cylindrical workpieces against each other between two diametrically opposed outer roll forming tools and an inner rolling arbor but that it is known to axially roll form workpieces by pressing the workpieces between two diametrically opposed outer roll forming tools and an inner arbor as shown in *Ficker et al.* (Figs. 2 and 9). In examiner's opinion it would therefore have been obvious to person skilled in the arts to have substituted the roll arrangement of *Timmermans* with the one taught by *Ficker et al.* in order to improve the quality of resulting composite workpiece. In regard to claims 15-18 examiners states that the method as modified could be used for rings or pipes being loosely inserted into each other or having radial play.

The cited reference discloses in col. 1, lines 29-31, that the rolling process according to the invention includes the step of arranging a steel cylinder which is internally lined with bearing metal within a gap formed by a pair of rolls of which one roll (a) has a small diameter and the other roll (e) a relatively large diameter. Examiner's attention is directed to col. 2, lines 7-12. Here it is stated that the reference character (m) indicates the composite steel lead bronze cylinder in its final state upon completion of rolling application and that this final shape of the cylinder is indicated in solid lines. The dotted line m (radially inwardly positioned) indicates the shape of the steel-lead-bronze cylinder **before** the rolling process is initiated. In col. 2, lines 12-22, it is further stated that the when the steel-lead-bronze cylinder m has the shape indicated in solid lines the cylinder is removed, cut or sliced in axial direction, and then spread out or flattened to a planar lead-bronze lined sheet of steel. This material is then formed into bearings of bushings. This relates to the background of the invention discussed in col. 1, lines 6-21. In this background section it is also disclosed how the lining of lead bronze is applied to the cylinder:

"When a steel cylinder which has been internally lined by centrifugal action with a bearing metal, e.g., with lead bronze, ... steel cylinder must be flattened and rolled between rolls in order to obtain a material that lends itself to the formation of bearings."

This is the basic process of producing composite bushings and bearings the cited reference is concerned with. The method disclosed thus concerns steel cylinders where the inner lining has been applied by centrifugal action (= centrifugal casting).

In centrigual casting a mold is rotated about its axis and the molten metal is poured into the mold. The molten metal is centrifugally thrown toward the mold wall (or in case of the steel cylinder against the inner wall of the steel cylinder. The molten metal solidifies after cooling and an intimate connection of the solidified metal on the substrate cylidner is provided. The reference to *Timmerman* therefore cannot anticiapte or make obvious the steps of inserting a first hollow cylinder into a second hollow cylinder such that radial play is present between the first and second hollow cylinders as claimed in instant claim 14.

Claims 19 and 20 stand rejected under 35 USC 103(a) as being unpatentable over *Timmermans* in view of *Ficker et al. (DE 19526900)* in view of *Reverman (US 3,068,563)*.

The reference to *Reverman* is cited by the examiner to show that a coating is applied to an outer surface of an inner member as set forth in col. 2, lines 15-18. It would thus have been obvious in view of this teaching to apply a coating to the outer surface of the inner workpiece in *Timmerman/Ficker*.

The cited reference to *Reverman* concerns a resin adhesive that is to seal the gap between two tubes; see col. 1, lines 24-47. An adhesive **sealant** such as an **epoxy resin** that is adhesive to the metal of both tubes is applied to the surface of one of the tubes. The sealant is substantially impervious to fluids. The tubes are inserted and rolled to interlock the tubes and at least one region is formed where the adhesive film is reduced to zero between the tube walls. The joint formed in this way is heated to cure the adhesive between the tubes. The adhesive during initial heating becomes more fluid than it was previously so that it flows into the interstices and voids between the tubes and a uniform seal is created upon curing. The reference to *Reverman* thus sets forth an adhesive sealant that enhances the mechanical joint between the tubes and seals the tubes relative to one another. However, an adhesive or expoxy resin cannot suggest an aluminum layer applied to one of the tubes.

The aluminum layer applied to one of the tubes provides a positive-locking connection because upon rolling it penetrates into the microstructure of the surfaces of both cylindrical bodies and prevents displacement relative to one another. In the alternative the aluminum layer is used to reduce weight of the produced composite workpiece. This is disclosed in the specification in the paragraph bridging pages 4 and 5. Claims 19 and 20 as amended are therefore not obvious in view of the cited references.

Reconsideration and withdrawal of the rejection of the claims under 35 USC 103 are therefore respectfully requested.

CONCLUSION

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call or **e-mail** from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on Mai 22, 2009,

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